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ment shown in their selection are almost beyond criticism. Why the Gephyrea and the Hirudinea are placed above the more highly specialized Chætopod worms we do not understand. As also why the Phyllopods should be placed at the base of the Crustacea, below the Copepoda and barnacles. This classification has been strenuously advocated by Claus, but not, we suppose, generally accepted; the reasons militating against this view are many and urgent; the Branchipodidæ, with their stalked eyes and highly specialized bodies, appear to stand nearer the stalked-eyed Crustacea than any other Entomostraca; and to go directly from the root-barnacles to the Malacostraca is straining more than one point in taxonomy. In treating the trilobites no reference whatever is made to American work, especially that of Walcott, who has demonstrated that they had hard jointed limbs; Claus states the obsolete view that they were "soft and delicate."

Among the Myriopods Pauropus is assigned to the Polydesmidæ, when it certainly represents a distinct suborder if not order. The Physopoda or Thrips are regarded as a tribe of Pseudo-neuroptera, although embryology shows they are Hemiptera. The taxonomy of the Lepidoptera seems to us to be very objectionable and old-fashioned, while it is a comfort to see that the Hymenoptera are placed at the head of the insect series. We shall look with great interest to the appearance of the second, closing volume.

GOODALE'S PHYSIOLOGICAL BOTANY.[1]— In the year 1879 Dr. Gray brought out the new (sixth) edition of his widely known and used Botanical Text-book. The new book covered much less ground than the older editions, being confined to the structural botany of the phanerogams. It was then announced that Dr. Goodale was to prepare a second volume to be devoted to physiological botany, Dr. Farlow a third devoted to cryptogamic botany, and that the series was to be completed by a fourth volume to include a sketch of the natural orders of phanerogams. After waiting six years we have the pleasure of perusing advance sheets of the long-promised Vol. II. The part before us is devoted to the histology of the phanerogams, and is soon to be followed by Part II, which is to deal with vegetable physiology.

Upon opening the book we have first an interesting chapter devoted to histological appliances; a most useful chapter indeed it will prove to all workers in the botanical laboratory. In this we observe with pleasure the remark that "other things being equal, a microscope with a short tube and with a low stand will be most convenient on account of the large number of cases in which reagents must be employed, their application requiring a horizontal stage."

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[1] *Gray's Botanical Text-book* (sixth edition). Vol. II. Physiological botany. I. Outlines of the histology of phænogamous plants. By GEORGE LINCOLN GOODALE, A.M., M.D., professor of botany in Harvard University. Ivison, Blakeman, Taylor & Co., New York and Chicago. 1885. pp. vii, 194, 12mo, 141 figures.

In chapter I we have a discussion of the vegetable cell in general, its structure, composition and principal contents. Here it is encouraging to note that the author still holds to the view that the cell is the unit in vegetable anatomy. The most interesting portion of this chapter is that devoted to plastids (including chlorophyll), protein granules and starch. In chapter II the modifications of cells, and the tissues they compose, are taken up.

The provisional classification adopted is as follows:

I. Cells of the fundamental system, or PARENCHYMA cells—permanent typical cells.
  1. *Parenchyma* cells, strictly so-called, including as modifications *collenchyma* cells and *sclerotic* parenchyma cells, or grit cells, such as the lignified cells of seed-coats and drupes, etc.
  2. *Epidermal* cells and their modifications, *e. g.*, trichomes.
  3. *Cork* cells, forming suberous parenchyma, or cork.

II. Cells and modified cells of the fibro-vascular system—PROSENCHYMA in the widest sense.
  1. Cells of *prosenchyma* proper.
    a. Typical wood-cells and woody fibers, including libriform cells and the secondary wood-cells.
    b. Vasiform wood-cells or tracheïds.
  2. *Vessels* or ducts.
    a. Dotted.
    b. Spirally marked.
    c. Annular.
    d. Reticulated.
    e. Trabecular.
  3. *Bast-cells*, bast-fibers or liber-fibers.

III. SIEVE-CELLS, or cirhose cells.

IV. LATEX-CELLS.

It will be observed that four principal kinds of cells are here recognized, implying four kinds of tissues. Parenchyma is made to include collenchyma and short-celled sclerenchyma, and prosenchyma likewise includes fibrous cells as well as vessels (tracheary tissue).

Chapter III is devoted to the minute structure and development of root, stem and leaf of phanerogamous plants. The treatment of these subjects is very full and, to our mind, quite satisfactory, although one of the most difficult of clear presentation. The fourth and fifth chapters are devoted respectively to the minute structure and development of the flower, fruit and seed, and the physiological classification of tissues, both of which subjects are briefly treated. The last chapter is particularly interesting, and one finishes reading it with the regret that it had not been made longer.

We shall reserve the discussion of some points in the chapters before us until after the appearance of part second, but in the meantime must congratulate the botanical fraternity of this country upon the appearance of this profound and still clearly written work.—*Charles E. Bessey.*

SMITH'S DISEASES OF FIELD AND GARDEN CROPS.[1]—In this compact little volume the author has brought together the notes of a course of lectures given at the request of the officers of the Institute of Agriculture at the British Museum, South Kensington. It was the endeavor of the author, we are informed in the introduction, to keep three objects clearly in view, viz., "*first*, the description only of such diseases as are of economic importance; *second*, the definition of all the phenomena of the diseases in familiar words, such as, with proper attention, may be understood by all; this has been done without sacrificing scientific accuracy, as all botanical terms in common use are adverted to and explained; *third*, the consideration of the best means of preventing the attacks of plant diseases."

An examination of the book warrants us in saying that the author has succeeded admirably in his attempt. Every progressive farmer and gardener ought to procure this book and give it a careful reading.

While thus commending this book as a most excellent one in plan and purpose, we need not accept all the author's views. But this will not necessarily lessen the value of the work for those for whose benefit it was designed.—*Charles E. Bessey.*

RECENT BOOKS AND PAMPHLETS.

Cope, E. D., and Wortman, J. L.—Fourteenth report of the State geologist (Part II). Post-pliocene Vertebrates of Indiana. 1884. From the authors.

W. K. Brooks et al.—Report of the oyster commission of the State of Maryland, Jan., 1884. From the authors.

Beecher, C. E.—Some abnormal and pathologic forms of fresh-water shells from the vicinity of Albany, N. Y. Ext. 36th report N. Y. Mus. Nat. Hist., 1884. From the author.

Hannen, R.—Notes on the town and neighborhood of Fordingbridge, Hants. 1883. From the author.

Dames, W.—Notes on Lestodon (Gervais). Abd. Sitz. k. Akad. Ber.

——Renthierreste von Rixdorf. Ext. natur. Freunde zu Berlin, 1883.

——Vorkommen von Hyænarctos in den Pliocän-Ablagerungen von Pikermi bei Athen. Abd. idem.

——Eine neue Antilope aus dem Pliocän von Pikermi bei Athen, Abd. idem.

——Fischzahne aus der obersenonen Tuffkreide von Mastricht. Abd. idem.

——Hirsche und Mäuse von Pikermi in Attika. Abd. a. d. Zeitschr. d. Deutsch. Geol. Ges. Jahrg., 1883.

——Ueber Ancistrodon. Abd. dem.

——Ueber eine tertiäre Wirbelthier fauna von der Westlichen Insel des Birket-el-Qurun im Tajum (Ægypten). Abd. Sitz. des k. Preus. Akad. der Wiss. zu Berlin. All from the author.

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[1] *Diseases of Field and Garden Crops, chiefly such as are caused by Fungi.* By WORTHINGTON G. SMITH, F.L.S., M.A.I., member of the scientific committee Royal Horticultural Society. With 143 illustrations drawn and engraved by the author. London, Macmillan & Co., 1884. pp. xxiv, 353, 12mo.